

Work Order ID 85567

June-11-12 9:04:56 AM

U/R

85567

Page 1

Item ID: D350-748-101

Accept

N9000040100

Setup Start ***NS1***

Revision ID: U/R

Stop ***NS2***

Item Name: Crosstube Installation, High Fwd

Start Date: 11/06/2012 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 05/07/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: MLJ Date: 12/06/11 Tooling:

Run Start ***NR1***

QC: Date: SPC (Y/N):

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D350-748-141

F U/R

OK 12/6/11

100

0.00

100

DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPPD350-748-101

CHG002

110

0.00

110

BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT

****UNDER BEND .225" PER SIDE****

120

0.00

120

QC 15- Crosstube Dimensional Check

QC

Memo

0.00

Quality Control

13-4-10

12-12-18

10/12/31

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

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Page 2

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N900040100

Setup Start ***NS1***

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Item Name: Crosstube Installation, High Fwd

Stop ***NS2***

Start Date: 11/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 05/07/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

125

0.00

125

HandFXtube

Hand Finishing Crosstubes

Memo

Stress relief

Heat treat crosstube as per QSI010 4.3

Temp: _____

Start time: _____

Finish time: _____

0.00

P10:19086

C213/02/12 x1

127

QC6- Inspect dimensions to drawing

0.00

127

QC

Quality Control

Memo

0.00

DAS
16

12/12/13

Sp 12-12-31

Receive + Inspect

126

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Page 3

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Stop ***NS2***

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Cust Item ID:

Required Date: 05/07/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Crosstubes	0.00							
130									
Crosstubes	Memo	0.00							
Crosstubes	1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B &C Drill Jigs, Set-up drill table as per QSI 010								
	2-Deburr								
	3-Engrave Part # and Batch # as per Dwg D350-748-141								
	4-Remove all marks from tube within limits of D350-748-141								
	5- Apply a light coat of LPS3 on the interior of tube Batch: _____								
140	QC5- Inspect part completeness to step on W/O	0.00							
140									
QC	Memo	0.00							
Quality Control	CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)								

Handwritten: 13-1-3

Handwritten: DAS 15 9-89 13.13

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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Page 4

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Item ID: D350-748-101

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Setup Start

NS1

Revision ID: U/R

Item Name: Crosstube Installation, High Fwd

Stop

NS2

Start Date: 11/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 05/07/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150

Outsource process-Cadplate per QSI017 4.1.9.1

0.00

150

Outsource3

Outsource process - Cad plate

Memo

Issue P/O:

Stress relief at 375° for 5 hours

Magnetic Particle Inspect per ASTM E1444

Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2

Embrittle relief at 375° for 8 hours, Chromate Treat

Possibe Supplier: Southwest United Industries

Ensure Certificate of Conformity is attached

0.00

18743

CL13/01/07

~~CL12/11/12/1790~~

160

Receive & Inspect for Damage & Mat'l Certs

0.00

160

Packaging

Packaging

Memo

Ensure certificate of conformity is attached

0.00

SEE W/O CHG ATTACHED

14/12/2016

170

QC5- Inspect part completeness to step on W/O

0.00

170

QC

Quality Control

Memo

0.00

DAS
16
8-83

13/1/13

1x SPB-2-27

POSITIVE RECALL

EFFECTIVE 12/6/11 AUTH af

RELEASED af DATE 13/4/12

P/O: accien

P/O: 19433 x1

word attached c/c to w/o 14/3/12 G

W/O: 85567		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D350-748-101 PAR #: _____ Fault Category: X-tube NCR: Yes No DQA: Autr Date: 13/04/16
 Resolution: _____ Disposition: Re-work QA: N/C Closed Date: 13/4/12

NCR: 13.2483		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
13/1/30	150	Found after CAD Plating that machining marks were above the call: they will be noticeable.	GP 13/4/1	Blend out mark. ensure to be cautious of the call Return to CADATH. For CAD remove P/O 19238 *ALL employees must wear	msr	GP 13/4/1	GP 13/4/1	
		After Paint	GP 13/4/1	all previous areas/equipment Buff out marks Careful not to touch the call	Rm 13-0228	DAS 16 13/6/16	GP 13/4/1	DAS 16 13/3/1
		REVISION 04 13/4/11	GP 13/4/1	Return to CADATH For Re CAD Plating P/O 19238	13/3/2014	DAS 16 13/6/16	GP 13/4/1	

NOTE: Date & initial all entries

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85567

Page 5

June-11-12 9:04:56 AM

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Setup Start ***NS1***

Revision ID: U/R

Item Name: Crosstube Installation, High Fwd

Stop ***NS2***

Start Date: 11/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 05/07/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	SprayPaint	0.00				1	0	Pb	J.P./AG 13-04-03
180									
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside crosstube as per QSI 005 4.2 2-Prime Outside of Tube as per Dart QSI 005 4.2 <i>Paint</i>	124403 / 3:30-9:10 124376 1.60 - 1.75							
190	QC14- Inspect Spray Paint	0.00							Pb →
190									
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches	0.00							
200	Crosstubes	0.00				1			J.P./WH 13-04-08
200									
Crosstubes	Memo	0.00							
Crosstubes	1-Install Ground wire Insert, then insert screw and washer 2-Install Abrasion strips as per Dwg D350-748-141 & QSI 035. 3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS								

W/O: 85567		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D350-748-101 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
13/03/20	1	At NDT inspection it was found that the tube has indentation on it. Further investigation found that it was from the Re CAD Plat of the tube.	GP 13/4/1	CAD not blasted so Accatate Per email From AP to ED 13/04/01 (Attaches)	DAS 16 13/04/01	GP 13/4/1	GP 13/4/1	(DAS 16) 13/04/01
13/04/04	160	Found at inspection that there were "Runs" in the Paint R.C. to be with Paint. suit	DAS 16 Q22012 13/04/04	Scuff with 320 grit PARZ. As Per Q22004 + clean Re PA. + As Per Q22004	AS 13-4-5 S.P. H/W 13-4-5	DAS 16 13/04/04	DAS 16 Q22012 13/04/04	DAS 16 13/04/04

NOTE: Date & initial all entries

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Page 6

June-11-12 9:04:56 AM

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Stop ***NS2***

Start Date: 11/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 05/07/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210 *210* QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00				1			
220 *220* Packaging Packaging	Pick Kit Memo	0.00 0.00							
230 *230* QC Quality Control	QC4- 100% Inspect kits for completeness Memo	0.00 0.00				1			

DAS
27
1349

3/4/9 108

13410

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Page 7

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N900040100

Setup Start ***NS1***

Revision ID: U/R

Item Name: Crosstube Installation, High Fwd

Stop ***NS2***

Start Date: 11/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 05/07/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240		0.00							
240	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D350-748-101								
	Location: <u>114</u>								
	PPP Rev: <u>D</u>								
250									
250	QC21- Final Inspection - Work Order Release	0.00							
QC	Memo	0.00							
Quality Control									

DAS
06
9-8

13410 *[Signature]*

13/4/11 *[Signature]*

13-04-10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Picklist Print

June-11-12 9:05:00 AM

Page 1

Work Order ID: 85567

85567

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 11/06/2012

Required Date: 05/07/2012

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A New Issue 06-07-05 JLM
 IPP Rev:B Update qty of MS21042L5 06-09-12 KJ VERIFY
 BY:DD
 IPP Rev:C Rev B 07-11-15 DD
 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC IPP Rev:F
 10.08.04 added QSI010 4.3 DD verf:EC
 IPP REV:G ADD UNDER BEND COMMENT 12-05-28 JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D350-748-141TRN

Manufactured No

110

Each

3.0000

1

1

D350-748-141TRN

**

SAD 12-12-18

Crosstube Turning Detail

Location

Loc Qty

Loc Code

LG

3

74718

1

83277

1

83278

1

B84654

①

ALS4-1032-225

Purchased

No

200

Each

731.0000

1

AI S4-1032-225

**

JP / 12/13/04/08

Insert

Location

Loc Qty

Loc Code

ST281

708

108696

146

110768

62

118386

55

118966

68

121269

377

ST282

23

120410

10

120451

13

124468

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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June-11-12 9:05:00 AM

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D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 11/06/2012

Required Date: 05/07/2012

Start Qty: 1.00

Required Qty: 1.00

AN960-ID10

NAS1149D0363J

Purchased

No

200

Each

0.0000

1

1

AN960.ID10

Washer

D2856-400

Manufactured

No

200

f

207.0445

1.181

1.243158

D2856-400

Abrasion Strip

Location

Loc Qty

Loc Code

ST403

197.6

81875

197.6

ST409

9.4445

63735

0.6696

68076

0.3149

71164

8.46

D3502-1

Manufactured

No

200

Each

79.0000

2

2

D3502-1

Support

Location

Loc Qty

Loc Code

LG050

60

77041

60

ST051

19

73419

11

74873

8

MS21920-20

Purchased

No

200

Each

84.0000

2

2

MS21920-20

Clamp (per MIL-DTL-8783C)

Location

Loc Qty

Loc Code

LG050

84

116799

8

120676

8

121067

18

121274

50

**

**

**

**

JP/ml 13.04.08

JP/ml 13.04.08

JP/ml 13.04.08

JP/ml 13.04.08

June-11-12 9:05:00 AM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
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Page 3

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Parent Item Name: Crosstube Installation, High Fwd

Start Date: 11/06/2012

Required Date: 05/07/2012

Start Qty: 1.00

Required Qty: 1.00

MS27039-1-10

Purchased

No

200

Each

225.0000

1

1

MS27039-1-10

Screw

**

m/m / JP 15-04-08

Location

Loc Qty

Loc Code

GA

100

120449

100

ST291

25

120120

25

ST308

100

122027

100

124326

AN4-41A

Purchased

No

220

Each

539.0000

8

8

AN4-41A

Bolt

**

Signature

Location

Loc Qty

Loc Code

360

181

121185

181

ST360

358

115108

3

115705

7

118451

29

118838

50

119328

100

120423

150

121205

15

121573

4

120423

SMB

June-11-12 9:05:00 AM

Shop Packet Print

Page 3

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Parent Item Name: Crosstube Installation, High Fwd

Start Date: 11/06/2012

Required Date: 05/07/2012

Start Qty: 1.00

Required Qty: 1.00

AN4-6A Purchased No

220 Each

1,385.000

AN4-6A
Bolt

**

16 16
M123358

SM

Location

Loc Qty

Loc Code

355	93	
121631	93	
ST356	1292	
119017	792	
121243	500	

AN5-32A Purchased No

220 Each

245.0000

AN5-32A
Bolt

**

4 4
M124936

SM

Location

Loc Qty

Loc Code

ST339	145	
119862	50	
120423	75	
120910	20	
ST340	100	
121541	100	

AN960JD416 NAS1149D0463J Purchased No

220 Each

30.0000

AN960JD416
Washer

**

32 32
M124778

SM

Location

Loc Qty

Loc Code

ST351	30	
116289	10	
119097	20	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Parent Item Name: Crosstube Installation, High Fwd

Start Date: 11/06/2012

Required Date: 05/07/2012

Start Qty: 1.00

Required Qty: 1.00

AN960JD516

NAS1149D0563J

Purchased

No

220

Each

16.0000

AN960JD516

Washer

Shp

Location

Loc Qty

Loc Code

ST338

16

2612

16

D3500-1

Manufactured

No

220

Each

75.0000

D3500-1

Saddle

Shp

Location

Loc Qty

Loc Code

ST423

14

78595

14

ST424

31

73405

20

73406

8

76000

3

ST425

30

76940

30

D3501-1

Manufactured

No

220

Each

367.0000

D3501-1

Bushing

Shp

Location

Loc Qty

Loc Code

ST051

367

67757

4

73391

6

74866

207

77033

61

81955

26

83253

63

8

**

8

**

122452

4

**

4

88346 1x

B9461934

16

**

16

88532

(43/4/5 @)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

June-11-12 9:05:00 AM

Work Order ID: 85567

85567

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 11/06/2012

Required Date: 05/07/2012

Start Qty: 1.00

Required Qty: 1.00

MS21042L4

Purchased

No

220

Each

3,423.000

24

24

MS21042L4

Nut

Sm

Location

Loc Qty

Loc Code

ST300

3423

119075

116

121011

232

121444

2775

121652

300

**

m/2923/ Ce

MS21042L5

Purchased

No

220

Each

1,381.000

4

4

MS21042L5

Nut

Sm

Location

Loc Qty

Loc Code

300

500

121652

500

ST300

881

108827

4

116105

5

116548

43

117611

18

119109

795

17651

8

2937

8

**

m/23900 Ce 13/4/80

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

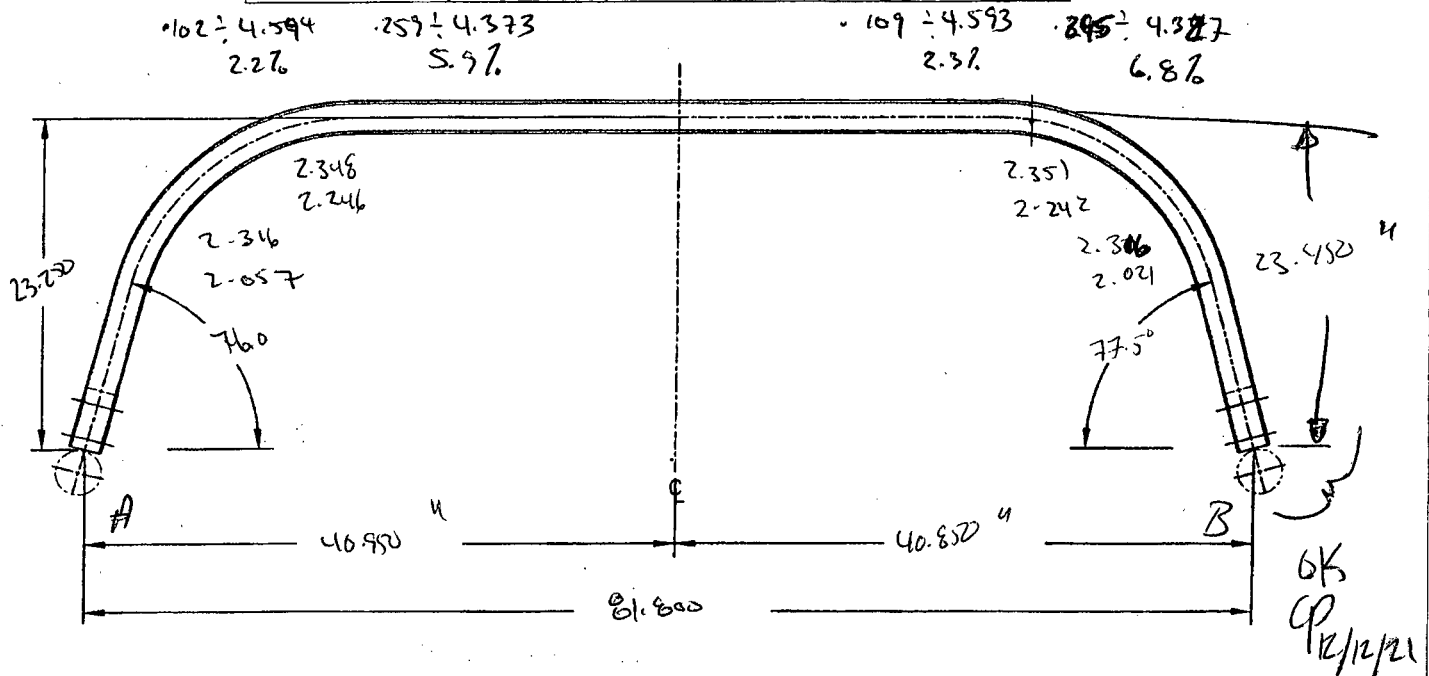
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	85567
Description: Crosstube High Fwd (AS350/355)	Part Number:	D350-748-101
Inspection Dwg: D350-748-141	Rev: F	Page 1 of 1

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
twist = 0.021
Side A = 2.22 crush @ top 5.9% @ Bottom
Side B = 2.37 crush @ top 6.8% @ Bottom

QC15 Inspection	FOAS
Date	12/12/21

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	11.11.07	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Item	Qty	Part Number	Description
	-141		
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6015-125	CROSSTUBE (OR D6017-115)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115
FINISHED LENGTH = 110.270±0.06
- FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- WEIGHT: 30.45 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 85567-465

12/06/11

UNDER REVIEW

11.07.12

RELEASED
2011-01-18

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.11.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D350-748-141	REV. F SHEET 1 OF 4
TITLE CROSSTUBE (AS 350/355 HI FWD)	SCALE NTS
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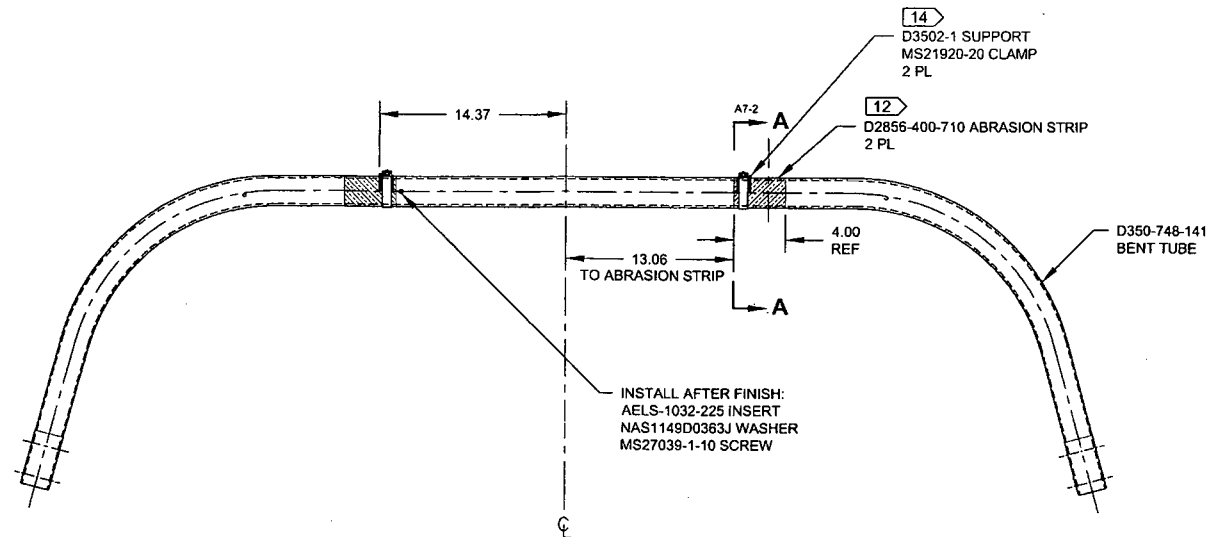
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

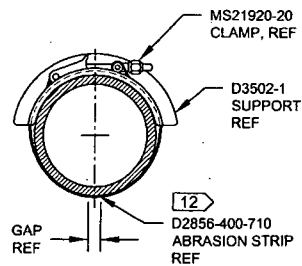
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



**D350-748-141
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 4X

UNDER REVIEW

RELEASED
2011-01-11

DESIGN	92	DART AEROSPACE LTD	
DRAWN	92	HAWKESBURY, ONTARIO, CANADA	
CHECKED	92	DRAWING NO.	REV. F
MFG. APPR.	92	D350-748-141	SHEET 2 OF 4
APPROVED	92	TITLE	SCALE
DE APPR.	92	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
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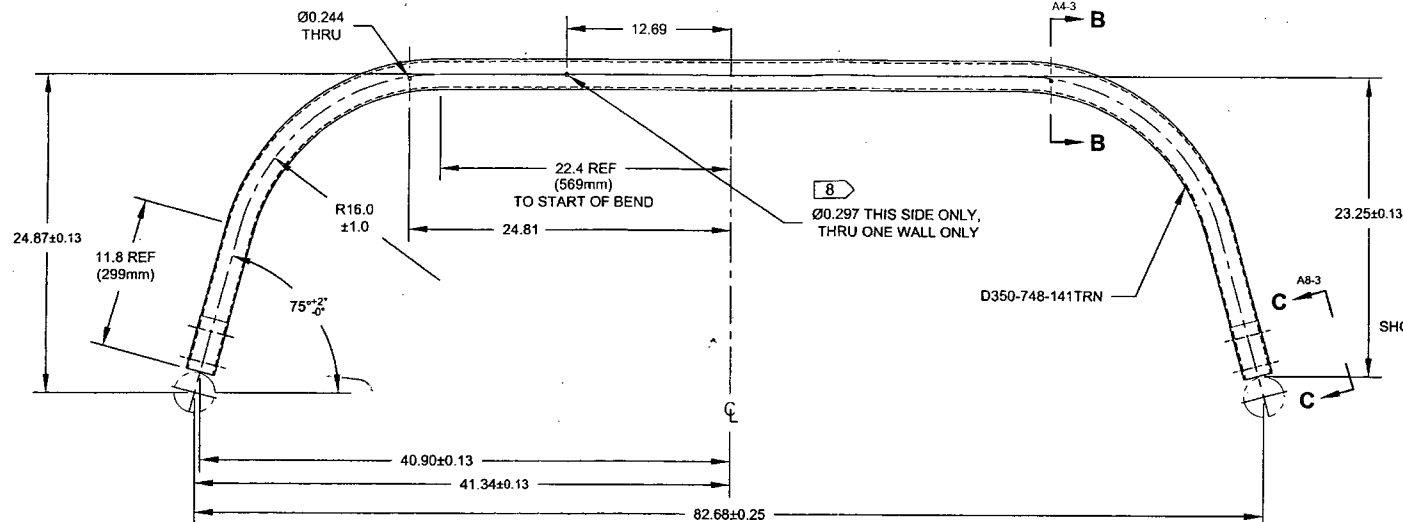
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

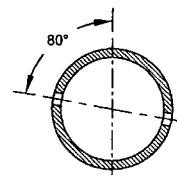
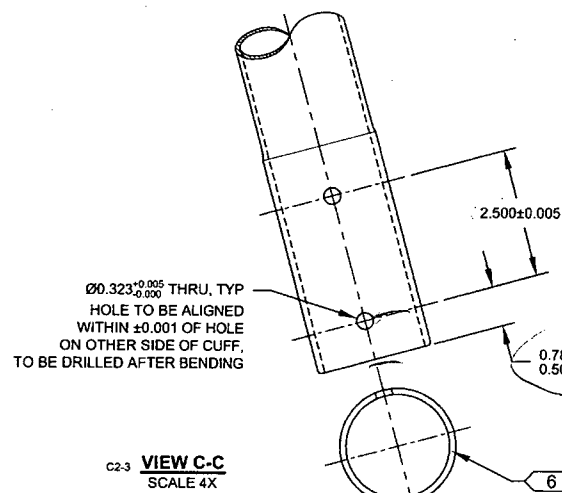
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



D350-748-141
BENDING AND DRILLING DETAIL 10



UNDER REVIEW

11.07.12

RELEASED
2011-01-18

DESIGN	QP	DART AEROSPACE LTD	
DRAWN	QP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	B	DRAWING NO.	REV. F
MFG. APPR.	C	D350-748-141	SHEET 3 OF 4
APPROVED	H	TITLE	SCALE
DE APPR.	H	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY FORM WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD</small>	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

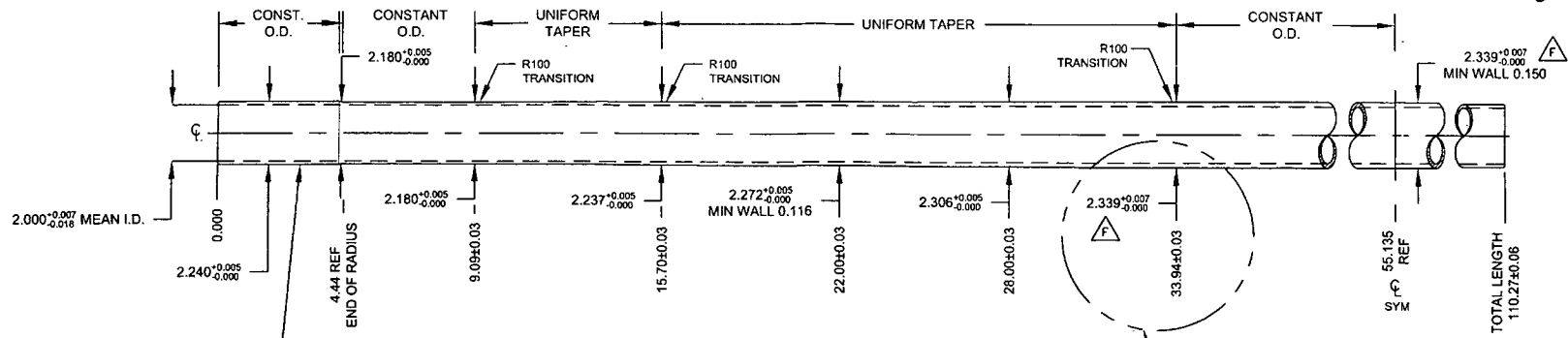
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

8 7 6 5 4 3 2 1

25567



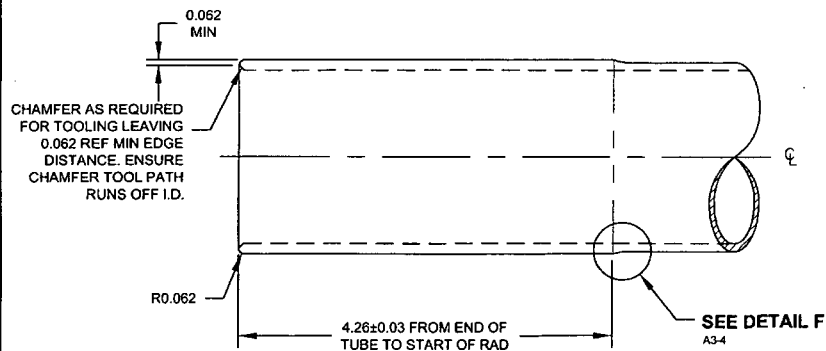
SEE DETAIL D
A6-4

SEE DETAIL E
A1-4

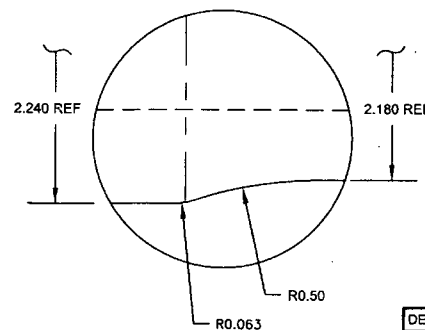
UNDER REVIEW

11.07.12

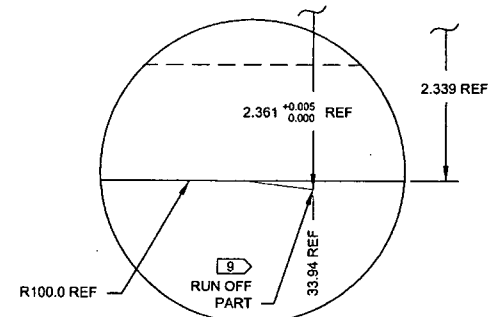
**D350-748-141TRN
TURNING DETAIL**



**DETAIL D:
CROSSTUBE CUFF** C7-4
SCALE 3X



**DETAIL F:
CUFF TRANSITION** A5-4
NOT TO SCALE



**DETAIL E:
TAPER RUN-OFF** C3-4
NOT TO SCALE

RELEASED
2011-01-18

DESIGN	9P	DART AEROSPACE LTD	
DRAWN	9P	HAWKESBURY, ONTARIO, CANADA	
CHECKED	13	DRAWING NO.	REV. F
MFG. APPR.	13	D350-748-141	SHEET 4 OF 4
APPROVED	13	TITLE	SCALE
DE APPR.	13	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMPILED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD</small>	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.10.05	161	LOAD TUBE TO 3500 ¹⁶ FOR 1 MINUTE. REF D.S. EMBL.	<i>[Signature]</i>	130326	1	<i>[Signature]</i> 12	<i>[Signature]</i> 130326
11.10.05	162	NDT TUBE.					

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Tuesday, April 27, 2010 3:40 PM
To: 'Mike Petsche'
Cc: 'Bill Beckett'; 'L Lacelle'; 'Chris Provencal'; 'Dan Stow'; ssheldon@dartaero.com
Subject: 350 crosstubes

Mike,

I discussed the 350 crosstube load testing with Bill a little while ago and this plan makes sense to him.

So, my recommendation to clear these crosstubes is to load the fwd crosstubes to 3500 lb and the aft crosstubes to 3000 lb in the deflection test rig and document on the work orders that this test has been completed. Hold max load for 1 minute. Per TP-D350-748-2, these loads represent the maximum load on these crosstubes at gross weight and are below the yield point of the material. I would like to request that Chris Provencal witness these tests and sign off the work orders based on his experience with Dart landing gears. My feeling is that if there is a problem with the parts, it will manifest itself during this load test. I, for one, would feel a lot more confident in testing each crosstube in this manner than relying totally on what Exova has to say. I think it would be very difficult to reach a conclusion on the whole batch on the basis of cracks in two parts from the batch.

I believe that we can accomplish this before next Friday, which also gives us time to hear what Exova has to say in case it has an impact on our decision. So far, what I have seen from Exova shows me that there are fluctuations in the heat treating but the tubes are heat treated to our specification.

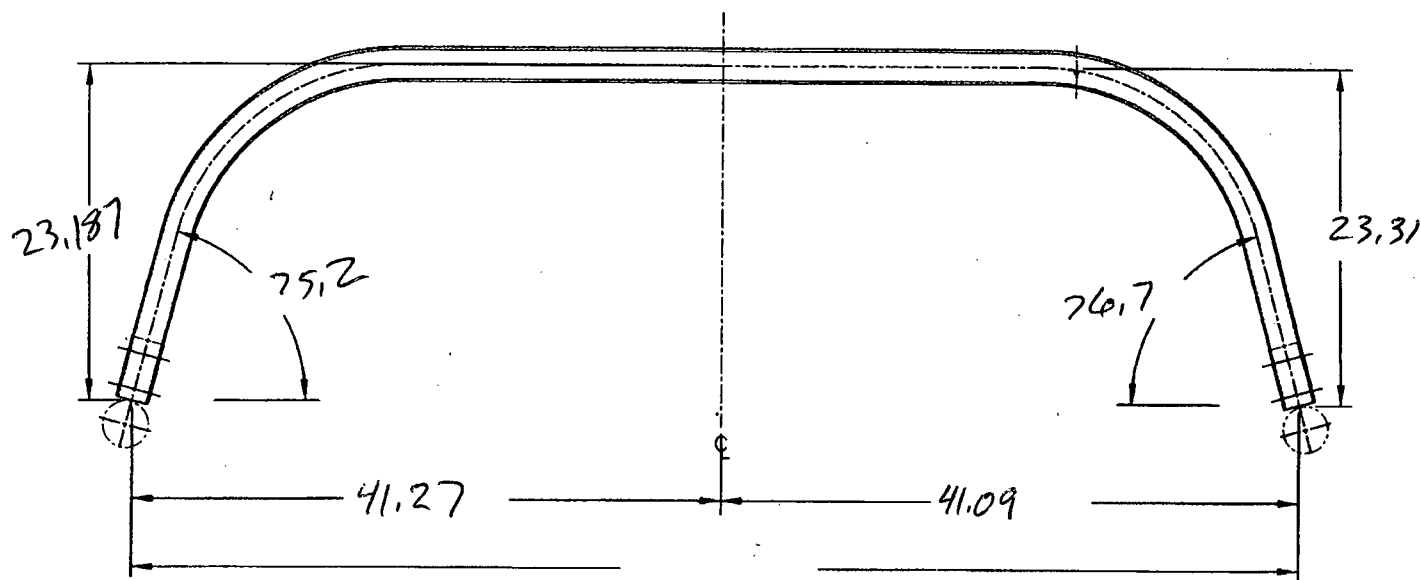
For this reason, I believe we should tell DHS that it looks like we will be able to start shipping 350 crosstubes by May 7th pending a successful Engineering test of the material.

David.

Measured Before De-Stress

DART AEROSPACE LTD		Work Order:	85567
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141	Rev: F	Page 1 of 1	

Required Dimension	Min	Max
Height	23.12	23.38
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.55	82.05
Bending Passes	7	--
Crushing	--	6%
Twist	--	0.25



	Side A	Side B
Bending Passes	37	39
Crushing		
Comments		
Twist 0.082"		

DP
12-12-18

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	11.11.07	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing & twist dimensions	KJ	<i>[Signature]</i>

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC J7R 5A8
Tel: 450-473-1884 / Fax: 450-491-5498

Recu de Livraison

Order	Shipper	Shipping Seq.
182269	1	67436

Shipped Complete

Customer **215**

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053

Shipped To:

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053

Purchase Order Number	Customer Shipper No.	Material Type	Order Date	Carrier
PO 18651		STEEL	2012/12/19	client

Container Type	# Of Containers	Container Comments
NIL	1	

CERTIFICAT

PACKING

Quantity Shipped: 5

Pounds Shipped: 155,00

Quantity Remaining: 0

Pounds Remaining: 0,00

CERTIFICAT

Quantity Shipped: 5

Pounds Shipped: 155,00

Signature:

Date:

Shipped ON: 2012/12/20

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC J7R 5A8
Tel: 450-473-1884 / Fax: 450-491-5498

Recu de Livraison

Order	Shipper	Shipping Seq.
182269	1	67436

Shipped Complete

Customer

215

DART AEROSPACE

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053

Shipped To:

DART AEROSPACE

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053

Purchase Order Number	Customer Shipper No.	Material Type	Order Date	Carrier
PO 18651		STEEL	2012/12/19	client

Quantity	Part No. / Part Name / Part Description	Pounds
----------	---	--------

5 D350-748-101 155,

CROSSTUBE

(1) CROSSTUBE

REFERENCE 90046

(1) D350-748-101

CROSSTUBE

REFERENCE: 85566

(1) D350-748-101

CROSSTUBE

REFERENCE 87340

(1) D350-748-101

CROSSTUBE

REFERENCE 91335

(1) D350-748-101

CROSSTUBE

REFERENCE 85567

CONTENANT: 1 NIL

CERTIFICAT

Quantity Shipped: 5

Pounds Shipped: 155,00

Signature:

Date:



Metcor Inc.

560, boul. Arthur-Sauvé, St-Eustache (Québec) J7R 5A8
Tél. 450 473-1884
Télécopieur/Fax administration 450 491-5498
Télécopieur/Fax production 450 491-6454

Page 2 / 2

Certificat de Conformité
Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
182269	1

CLIENT / customer 215
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
PO18651				
<u>SPÉCIFICATIONS DU PROCÉDÉ</u> processing specifications				
STRESS REL				
SAE AMS 2759/1 REV.E				
EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results				
Visual				
QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description		
5	155	D350-748-101 CROSSTUBE (1) CROSSTUBE REFERENCE 90046 (1) D350-748-101 CROSSTUBE REFERENCE: 85566 (1) D350-748-101 CROSSTUBE REFERENCE 87340 (1) D350-748-101 CROSSTUBE REFERENCE 91335 (1) D350-748-101 CROSSTUBE REFERENCE 85567 CONTENANT: 1 NIL		

560, boul. Arthur-Sauvé, St-Eustache (Québec) J7R 5A8
Tél. 450 473-1884
Télécopieur/Fax administration 450 491-5498
Télécopieur/Fax production 450 491-6454

Certificat de Conformité
Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
182269	1

CLIENT / customer **215**

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:

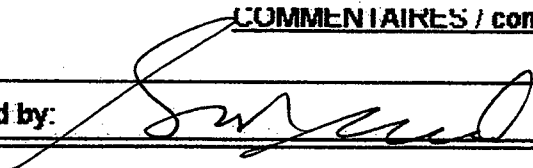
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

1

ON K8A 1K7

COMMENTAIRES / comments

CERTIFIÉ par / Certified by:



DATE: 2012-12-20



METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC, J7R 5A8

Tel: 450-473-1884 / Fax: 450-491-5498

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
182269	1

CLIENT / customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

1

Operation	Temp. spécifiée Specified Temp	Temps de trempage Spécifié Specified Soak Temp	Atmosphère	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
2.00 PREPARING	COMPTAGE									
3.00 STRESS RE	443°C +/- 6°C	2:00	air			701				
4.00 FINAL INSP							12-20-2012			12-20-2012

COMMENTAIRES / comments

LES TRAITEMENTS THERMIQUES SUR CETTE COMMANDE A ÉTÉ FAIT EN UTILISANT DES ÉQUIPEMENTS EN CONFORMITÉ AVEC LES REQUIS DE LA SPÉCIFICATION AMS2759.

TOUTES LES OPÉRATIONS DE TRAITEMENT THERMIQUE ONT ÉTÉ FAITES EN CONFORMITÉ AVEC LES REQUIS DE LA SPÉCIFICATION DEMANDÉE ET TOUTES LES VÉRIFICATIONS ET LES TESTS DEMANDÉES ONT ÉTÉ FAITES ET DOCUMENTÉES.

AUCUN CHANGEMENT OU DÉROGATION N'A ÉTÉ FAITE PAR RAPPORT AU TRAITEMENT THERMIQUE DEMANDÉ. ON CERTIFIE QUE LE MATÉRIEL A ÉTÉ FABRIQUÉ, ÉCHANTILLONNÉ, TESTÉ ET INSPECTÉ EN ACCORD AVEC LES SPÉCIFICATIONS DU MATÉRIEL ET LE BON DE COMMANDE ET LE MATÉRIEL RENCONTRE LES EXIGENCES SPÉCIFIÉS.

ACCOMPLISHED USING HEAT TREATMENT EQUIPMENT THAT MEETS THE REQUIREMENTS OF AMS 2759. ALL THE HEAT TREATMENT OPERATIONS WERE ACCOMPLISHED IN ACCORDANCE WITH THE REQUESTED/REQUIRED HEAT TREATMENT SPECIFICATION AND ALL REQUIRED VERIFICATIONS TEST HAVE BEEN PERFORMED AND DOCUMENTED. NO UNAUTHORIZED CHANGES OR ALL THE HEAT TREATMENT PROCESSING PERFORMED ON THIS ORDER WAS DEVIATIONS TO REQUIRED HEAT TREATMENT SPECIFICATIONS OR PROCEDURES HAVE BEEN PERFORMED.

WE CERTIFY THAT THE MATERIAL WAS MANUFACTURED, SAMPLED, TESTED AND INSPECTED IN ACCORDANCE WITH THE MATERIAL SPECIFICATION AND THE PURCHASE ORDER AND WAS FOUND TO MEET THE REQUIREMENTS.

APPROUVÉ par / Approved by:

J. L. O'Brien



DATE: 2012-12-20

/ Nous certifions que toute l'information comprise sur ce rapport est exacte et conforme aux requis du client. / We certify that all the information on this report is exact and in accordance with the order requirements.



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO18743

Purchase Order Date 1/07/13

PO Print Date 1/21/13

Page Number 1 of 3

Order From :

VC-CAD002

CADORATH COATING
2150 LOGAN AVE.
WINNIPEG, MB R2R 0J2
CA

Contact Name

Vendor Phone

Vendor Fax

Vendor Account Nbr

204 633 9420

204 633 8033

Buyer

Requisition Nbr

Tax Resale Nbr

Terms

Currency

FOB

Chantal Lavoie

10127-2607

Net 30

CAD

Destination-Collect

Ship To :

DART AEROSPACE LTD 1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

REVISED

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	85566	D350-748-101 CROSSTUBE	1/18/13 Yes	1.00	Day & Ross coll	\$776.2500	\$776.25
		Special : Stress relief at 375 degree for 5hrs Magnetic Particle Inspect per ASTM E1444 Cad Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375 degree for 8 hrs, Chromate Treat C of C req'd					
2	85567	D350-748-101 CROSSTUBE	1/18/13 Yes	1.00	Day & Ross coll	\$776.2500	\$776.25
		Speci : Stress relief at 375 degree for 5hrs Magnetic Particle Inspect per ASTM E1444 Cad Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375 degree for 8 hrs, Chromate Treat C of C req'd					

SPB-01-28

Change Nbr:

3

Change Date: 1/21/13

No substitution or deviation without
consent.

Certificate of Conformity or Material
Certification required: YES NO



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO18743**

Purchase Order Date 1/07/13

PO Print Date 1/21/13

Page Number 2 of 3

Order From :

VC-CAD002

CADORATH COATING
2150 LOGAN AVE.
WINNIPEG, MB R2R 0J2
CA

Contact Name

Vendor Phone

Vendor Fax

Vendor Account Nbr

204 633 9420

204 633 8033

Buyer

Chantal Lavoie

Requisition Nbr

Tax Resale Nbr

Terms

Currency

FOB

10127-2607

Net 30

CAD

Destination-Collect

3	87340	D350-748-101 CROSSTUBE	1/18/13	1.00	Day & Ross coll	\$776.2500	\$776.25
---	-------	---------------------------	---------	------	-----------------	------------	----------

Yes

Special Inst:

Stress relief at 375degree for 5hrs
Magnetic Particle Inspect per ASTM E1444
Cad Plate per AMS-QQ-P-416B, Class 1,
Type 2
Embrittle relief at 375 deegree for 8 hrs,
Chromate Treat
C of C req'd

4	90046	D350-748-101 CROSSTUBE	1/18/13	1.00	Day & Ross coll	\$1,151.2500	\$1,151.25
---	-------	---------------------------	---------	------	-----------------	--------------	------------

Yes

Special Inst:

Stress relief at 375degree for 5hrs
Magnetic Particle Inspect per ASTM E1444
Cad Plate per AMS-QQ-P-416B, Class 1,
Type 2
Embrittle relief at 375 deegree for 8 hrs,
Chromate Treat
C of C req'd
EXTRA CHARGE: MPI INSPECTION

5	91335	D350-748-101 CROSSTUBE	1/18/13	1.00	Day & Ross coll	\$776.2500	\$776.25
---	-------	---------------------------	---------	------	-----------------	------------	----------

Yes

SP 13-01-28

Change Nbr:

3

Change Date: 1/21/13

No substitution or deviation without
consent.
Certificate of Conformity or Material
Certification required - YES NO



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO18743**

Purchase Order Date 1/07/13

PO Print Date 1/21/13

Page Number 3 of 3

Order From :

VC-CAD002

CADORATH COATING
2150 LOGAN AVE.
WINNIPEG, MB R2R 0J2
CA

Contact Name

Vendor Phone

Vendor Fax

Vendor Account Nbr

204 633 9420

204 633 8033

Buyer

Chantal Lavoie

Requisition Nbr

Tax Resale Nbr

Terms

Currency

FOB

10127-2607

Net 30

CAD

Destination-Collect

Special Inst: Stress relief at 375 degree for 5hrs
Magnetic Particle Inspect per ASTM E1444
Cad Plate per AMS-QQ-P-416B, Class 1,
Type 2
Embrittle relief at 375 degree for 8 hrs,
Chromate Treat
C of C req'd

PO Total:

\$4,256.25

SP 13-01-28

Change Nbr:

3

Change Date: 1/21/13

No substitution or deviation without
consent.
Certificate of Conformity or Material
Certification required **YES** NO

Chantal Lavoie

From: Linda Lacelle <llacelle@dartaero.com>
Sent: January 21, 2013 11:47 AM
To: Chantal
Subject: FW: CrossTube P/O 18743 S/N 90046

Could you pls revise PO

From: Patrick Smith [mailto:psmith@dartaero.com]
Sent: January-21-13 11:46 AM
To: llacelle@dartaero.com
Subject: FW: CrossTube P/O 18743 S/N 90046

FYI

From: chris jones [mailto:chris.jones@cadorath.com]
Sent: January-21-13 11:26 AM
To: 'Patrick Smith'
Cc: 'Cisco Lindo'
Subject: RE: CrossTube P/O 18743 S/N 90046

Hi Pat

Sorry I forgot to include in the last email that there will be a charge of \$375 for the work performed so far. We have MPI inspected the part twice and it was run through the plating process. If you have any questions please let Cisco or I know.

Sincerely



**Chris
Jones**
Quality Assurance
Cadorath

Director of

Strength through Diversity
Serving industries that better the world

2070 Logan Avenue
Winnipeg, Manitoba, Canada R2R 0H9

Phone 204.633.2707 **Toll Free** 800.463.7069 **Fax**
204.632.7653 **Cell** 204.801.4190
chris.jones@cadorath.com **www.cadorath.com**

Cadorath News

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From: Patrick Smith [mailto:psmith@dartaero.com]
Sent: January-21-13 8:34 AM
To: chris jones; cisco@cadorath.com
Cc: cprovençal@dartaero.com; Eric Downing; llacelle@dartaero.com; dshepherd@dartaero.com; Mike Petsche
Subject: FW: CrossTube P/O 18743 S/N 90046

Hi Chris,

Our engineering staff has requested the tube returned as is, we will carry out the grinding, inspection and return for Cadmium plating with our next shipment.

Thanks,

Pat

From: Chris Provencal [<mailto:cprovencal@dartaero.com>]

Sent: January-21-13 9:16 AM

To: 'Patrick Smith'; David Shepherd

Cc: 'Eric Downing'; llacelle@dartaero.com; Mike Petsche

Subject: RE: CrossTube P/O 18743 S/N 90046

Pat,

My preference in this case would be to have the tube returned, we grind the tube, then return it to Cadorth in the next shipment. The grinding needs to be done longitudinally, and we won't be able to inspect the surface after CAD plate.

-Chris

From: Patrick Smith [<mailto:psmith@dartaero.com>]

Sent: Monday, January 21, 2013 7:26 AM

To: 'chris jones'

Cc: 'Cisco Lindo'; cprovencal@dartaero.com; Eric Downing; llacelle@dartaero.com

Subject: RE: CrossTube P/O 18743 S/N 90046

Hi Chris,

Go ahead and blend the mark and cadmium plate the tube, please mark the area on the tube once it is ready to ship and we will carry out a wall thickness check upon its arrival.

Thanks for the heads ups.

Regards,

Pat

From: chris jones [<mailto:chris.jones@cadorth.com>]

Sent: January-18-13 4:33 PM

To: 'Patrick Smith'

Cc: 'Cisco Lindo'

Subject: CrossTube P/O 18743 S/N 90046

Good afternoon Pat

We have processed a crosstube on P/O 18743 and after plating we have found what appears to be a crack in the tube at MPI. Our Ndt technician has called out a "axial crack 2" long into parent material on outside of crosstube" Now the concern we have is that under white light inspection it appears to be more of a gauge then a crack but we do not want to attempt to blend it out without your okay. Could you please let us know if there are acceptable blend limits or is there another course of action you would like us to take.

Sincerely



**Chris
Jones**
Quality Assurance
Cadorath

Director of

Strength through Diversity
Serving industries that better the world

2070 Logan Avenue
Winnipeg, Manitoba, Canada R2R 0H9

Phone 204.633.2707 **Toll Free** 800.470.7069 **Fax**
204.632.7663 **Cell** 204.801.4190
chris.jones@cadorath.com **www.cadorath.com**

Cadorath News

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CADORATH GROUP
NON CONFORMANCE REPORT

CADORATH AEROSPACE ☐
CADORATH COATING ☒

CADORATH DISTRIBUTION ☐
UNIFLYTE ☐

NOTE: THIS FORM MUST BE COMPLETED BY: CUSTOMER ☒ VENDOR ☐ BEFORE PROCESSING OF PART(S)

NCR#: **C1125**

CUSTOMER: ☒ **Dart Aerospace**

DATE: **01/22/13**

VENDOR: ☐ **N/A**

PART DESCRIPTION: **Crosstube**

CUSTOMER P/O #: **18743**

PART #: **D350-748-101**

SERIAL #: **90046**

QUANTITY: **one (1)**

PURCHASE ORDER INSTRUCTIONS: **CADMIUM PLATE IAW AMS-QQ-P-416C TYPE 2 YELLOW CLASS 2**

DISCREPANCY: **ONE CRACK 2 INCHES IN LENGTH WAS FOUND DURING MPI.**

TRAVIS SZABO

CADORATH/UNIFLYTE INSPECTION DEPARTMENT

CI
22

CUSTOMER: ☒

VENDOR: ☐ PLEASE COMPLETE THIS PORTION, SIGN AND RETURN TOP COPY OF THIS FORM TO CADORATH/UNIFLYTE

DATE: **01/22/13** P/O: **18743**

CUSTOMER INSTRUCTIONS: ☐

ATTENTION: QA-Inspection

VENDOR CORRECTIVE ACTION: ☐

AUTHORIZED SIGNATURE

NAME AND TITLE

DATE: 10/13/10

FORM: OPS 097
REVISION: 3

Packing Slip



Cadorath Coating

2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2

Phone: (204) 633-9420 Fax: (204) 633-8033

INVOICE NUMBER:

S64236

Sold To:

Dart Aerospace Ltd.
1270 Aberdeen St.

Hawksbury, ON K6A 1K7

Ship To:

Net 2% Interest Per Month charged on Overdue Accounts.

Any claims for shortages, overcharges, or damaged goods must be made within seven (7) days from receipt of goods.

Customer Order #:	Date Received:	Terms:	G.S.T. #:	Ship Via:	Ship Date:
PO18743	Jan-09-2013	NET 30 DAYS	10071 6547 RT0001		Jan-22-2013

Item #	Qty	P/N & Description	
1	1 EA	CROSSTUBE	S/N 85566
		P/N d350-748-101	W/O 120849
2	1 EA	CROSSTUBE	S/N 85567
		P/N d350-748-101	W/O 120850
3	1 EA	CROSSTUBE	S/N 87340
		P/N d350-748-101	W/O 120851
4	1 EA	CROSSTUBE	S/N 91335
		P/N d350-748-101	W/O 120853
5	1 EA	CROSSTUBE	S/N 90046
		P/N d350-748-101	W/O 120852

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Jan-22-2013

CONSIGNEE TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 120853
INVOICE #: 64236

**CONTRACT OR
PURCHASE ORDER #** PO18743

DESCRIPTION: CROSSTUBE

QTY 1

P/N # d350-748-101

S/N # 91335

STRIP AND CADMIUM PLATING IAW AMS-QQ-P-416C TYPE 2
YELLOW CLASS 2. MPI IAW ASTM-E-1444. BAKE HEAT CHART # 13-
30, 13-53.

CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.



Approved Inspector: _____

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Jan-22-2013

CONSIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 120851
INVOICE #: 64236

**CONTRACT OR
PURCHASE ORDER #** PO18743

DESCRIPTION: CROSSTUBE

QTY 1

P/N # d350-748-101

S/N # 87340

STRIP AND CADMIUM PLATING IAW AMS-QQ-P-416C TYPE 2
YELLOW CLASS 2. MPI IAW ASTM-E-1444. BAKE HEAT CHART # 13-
30, 13-53.

CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.

Approved Inspector:



**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Jan-22-2013

CONSIGNEE TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 120850
INVOICE #: 64236

**CONTRACT OR
PURCHASE ORDER #** PO18743

DESCRIPTION: CROSSTUBE

QTY 1

P/N # d350-748-101

S/N # 85567

STRIP AND CADMIUM PLATING IAW AMS-QQ-P-416C TYPE 2
YELLOW CLASS 2. MPI IAW ASTM-E-1444. BAKE HEAT CHART # 13-
30, 13-53.

CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.



Approved Inspector: _____

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Jan-22-2013

CONSIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 120849

INVOICE #: 64236

**CONTRACT OR
PURCHASE ORDER #** PO18743

DESCRIPTION: CROSSTUBE

QTY 1

P/N # d350-748-101

S/N # 85566

STRIP AND CADMIUM PLATING IAW AMS-QQ-P-416C TYPE 2
YELLOW CLASS 2. MPI IAW ASTM-E-1444. BAKE HEAT CHART # 13-
30, 13-53.

**CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.**



Approved Inspector: _____

IMPORTANT - PLEASE READ
 ATTENTION FOR MATCHING UP WITH
 OUR DESCRIPTIVE INVOICE THAT
 WILL FOLLOW. THIS IS THE ONLY
 COPY YOU WILL RECEIVE.

IMPORTANT - VEUILLEZ S.V.P. LIRE
 GARDER CETTE COPIE POUR
 VÉRIFICATION AVEC L'ÉTAT DE COMPTE
 DÉTAILLÉ QUI SUIVRA. CECI EST LA SEULE
 COPIE QUE VOUS RECEVREZ.



CUSTOMER'S COPY
COPIE DU CLIENT

NIR R-500048-5

G.S.T./T.P.S.
R119361467

www.dayross.ca

WPG 1745301

OTT
 DEST.

PICK-UP DATE / DE CUEIL	PPD/COLL	INPUT	CODE	RATE	MISC/DIVERS
JAN 22 2013	C	MZC	MZC	IBM	

SHIPPER / EXPÉDITEUR CADORATH PLATING CO LTD 2150 LOGAN AVE WINNIPEG MB R2P 0J2 PH.# 6323336		070854 GENERAL LTL CUSTOMER REF. NO. / N° RÉF. DU CLIENT 18743	LEVEL OF SERVICE / NIVEAU DE SERVICE DECLARED VALUE / VALEUR DÉCLARÉE SPECIAL INSTRUCTIONS / INSTRUCTIONS SPÉCIALES
CONSIGNEE / CONSIGNATAIRE DART AEROSPACE LTD 1270 ABERDEEN STREET HAWKESBURY ON K6A 1K7 PH.# 6323336		038326 BILL TO / FACTURÉ À DART AEROSPACE LTD 1270 ABERDEEN STREET HAWKESBURY ON K6A 1K7	METHOD OF PAYMENT / MODE DE PAIEMENT <input type="checkbox"/> CASH / COMPTANT <input type="checkbox"/> VISA <input type="checkbox"/> ACCOUNT / COMPTE <input type="checkbox"/> MC <input type="checkbox"/> AMEX CARD NO. / N° DE CARTE: EXPIRY DATE / DATE D'EXP:

ADVANCE CARRIER / NOM DU TRANSPORTEUR PRÉCÉDENT ADVANCE PRO NO. / N° DE FACT. PRÉ. BEYOND CARRIER NAME / TRANSPORTEUR SUBSÉQUENT

PIECES PIECES	DESCRIPTION OF ARTICLES & MARKS / DESCRIPTION DES OBJETS ET DE LEURS MARQUES	WEIGHT POIDS	LB	RATE / TAUX	GROSS AMOUNT MONTANT BRUT	% DISC. % ESC.	NET AMOUNT MONTANT NET
1	ASWT TRFAMT TARIFF PONUM FTAXLT ONHST PC/PLATED PARTS VOLUME WEIGHT IN POUNDS TARIFF AMOUNT 30508Q 18743 FUEL SURCHARGE LTL ONHST/TVH (133) 0001@ 090.00x034.00x034.00 @IN TOTAL CUBIC FEET 60.21		120 602 602 602				243.75 54.60 38.79
1	TOTAL # OF PIECES			YARD, ARRIVAL TIME AT CONSIGNEE			

ADDITIONAL CHARGES FRAIS ADDITIONNELS	HOME DELIVERY LIVRAISON À MAISON	EXCESS FLOORS ÉTAGE EXCÈS	REDELIVERY 2-ÈME LIVRAISON	48105	PAYMENT DUE UPON RECEIPT PAIEMENT SUR RÉCEPTION	.00
--	-------------------------------------	------------------------------	-------------------------------	-------	--	-----

SEE TERMS AND CONDITIONS ON REVERSE
 NO CLAIMS WILL BE ACCEPTED UNLESS NOTED
 ON CARRIER'S COPY AT TIME OF DELIVERY

VOIR TERMES ET CONDITIONS AU VERSO
 AUCUNE RÉCLAMATION NE SERA ACCEPTÉE À MOINS D'ÊTRE
 INDICUÉE SUR LA COPIE DU TRANSPORTEUR LORS DE LA LIVRAISON

PROOF OF DELIVERY
PREUVE DE LIVRAISON

Packing Slip



Cadorath Coating

2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2

Phone: (204) 633-9420 Fax: (204) 633-8033

INVOICE NUMBER:

S 64692

Net 2% Interest Per Month charged on Overdue Accounts.

Any claims for shortages, overcharges, or damaged goods must be made within seven (7) days from receipt of goods.

Sold To:	
Dart Aerospace Ltd.	
1270 Aberdeen St.	
Hawksbury, ON K6A 1K7	
ShipTo:	

Customer Order #:	Date Received:	Terms:	G.S.T. #:	Ship Via:	Ship Date:
PO19086	Feb-15-2013	NET 30 DAYS	10071 6547 RT0001		Feb-22-2013

Item #	Qty	P/N & Description	
1	1 EA	CROSSTUBE	S/N 85566
		P/N D350-748-101	W/O 121918
2	1 EA	CROSSTUBE	S/N 91335
		P/N D350-748-101	W/O 121922
3	1 EA	CROSSTUBE	S/N 87340
		P/N D350-748-101	W/O 121920
4	1 EA	CROSSTUBE	S/N 85567
		P/N D350-748-101	W/O 121919

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Feb-22-2013

CONIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 121919

INVOICE #: 64692

**CONTRACT OR
PURCHASE ORDER #** PO19086

DESCRIPTION: CROSSTUBE

QTY 1

P/N # D350-748-101

S/N # 85567

STRIP CADMIUM PLATING IAW MIL-STD-871.

CERTIFICATE: I certify that the items indicated here on have been inspected and tested and conform to all specifications and requirements detailed on the contract or purchase order.



Approved Inspector:

A handwritten signature in dark ink, consisting of a series of loops and strokes, positioned above a horizontal line.

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Feb-22-2013

CONIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 121920

INVOICE #: 64692

**CONTRACT OR
PURCHASE ORDER #** PO19086

DESCRIPTION: CROSSTUBE

QTY 1

P/N # D350-748-101

S/N # 87340

STRIP CADMIUM PLATING IAW MIL-STD-871.

CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.



Approved Inspector:

A handwritten signature in dark ink, appearing to be 'J. J. J.', written over a horizontal line.

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Feb-22-2013

CONSIGNEE TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 121922

INVOICE #: 64692

**CONTRACT OR
PURCHASE ORDER #** PO19086

DESCRIPTION: CROSSTUBE

QTY 1

P/N # D350-748-101

S/N # 91335

STRIP CADMIUM PLATING IAW MIL-STD-871.

CERTIFICATE: I certify that the items indicated here on have been inspected and tested and conform to all specifications and requirements detailed on the contract or purchase order.



Approved Inspector:

A handwritten signature in black ink, appearing to be 'S. S.', written over a horizontal line.

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Feb-22-2013

CONSIGNEE TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 121918

INVOICE #: 64692

**CONTRACT OR
PURCHASE ORDER #** PO19086

DESCRIPTION: CROSSTUBE

QTY 1

P/N # D350-748-101

S/N # 85566

STRIP CADMIUM PLATING IAW MIL-STD-871.

CERTIFICATE: I certify that the items indicated here on have been inspected and tested and conform to all specifications and requirements detailed on the contract or purchase order.



Approved Inspector: _____

A handwritten signature in black ink, appearing to be 'J. [unclear]', written over a horizontal line.

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Mar-22-2013

CONIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 122652

INVOICE #: 65198

**CONTRACT OR
PURCHASE ORDER #** PO19238

DESCRIPTION: CROSSTUBE

QTY 1

P/N # d350-748-101

S/N # 85567

STRIP IAW MIL-STD-871. MPI IAW ASTM-E-1444. CADMIUM PLATING
IAW AMS-QQ-P-416C TYPE 2 YELLOW CLASS 1. FINAL MPI IAW
ASTM-E-1444. BAKE HEAT CHART # 13-231 AND # 13-259.

CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.



Approved Inspector:

A handwritten signature in black ink, appearing to be 'R. [unclear]', written over a horizontal line.



LIQUID PENETRANT TEST REPORT

P- 12155

CLIENT Dart Aerospace DATE March 26 2013 PAGE 1 OF 1
ATTENTION Chantelle, Linda, Andy ACUREN JOB NO. 128-B-C0231 TIME AM ☐ PM ☒
ADDRESS 1270 Aberdeen St. PO/WO No. 19433
Hawthornbury, on WORK LOCATION As Address
PROJECT Pt - Wet Fluorescent Liquid penetrant inspection ACCEPTANCE STD. ASTM 1417/AS 1417 REV./DATE 2005
ITEM(S) EXAMINED - See Below

JOB DESCRIPTION PROCEDURE NO. LT-002 REV./DATE 2009 TECHNIQUE NO. LT-002 REV./DATE 2009
PART NO. PERFORMED A WET FLUO L.P.I. ON 100% OF THE EXTERNAL SURFACE ON
SCOPE ITEMS MENTIONED. MATERIAL ALUMINUM C/S THICKNESS N/A

TEST DETAILS

METHOD ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
FAMILY BRAND MagnaFlux BLACK LIGHT S/N 13790 ☐ OUTPUT > 1000 μ W/cm² ☐ AMBIENT < 2 fc
PENETRANT 21-67 MINIMUM DWELL TIME 45 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER H₂O MINIMUM DRY TIME > 10 MIN. OTHER
DEVELOPER SKD-52 MINIMUM DWELL TIME 30 MIN. LIGHT METER S/N 1092866 CAL DUE DATE oct 2013
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE

SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☒ MACHINED ☐ SHOT BLASTED ☐ CLEAN BARE METAL
SURFACE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/ 50°F ☐ 10°C/ 50°F TO 52°C/ 125°F ☐ > 52°C/ 125°F
RESULTS- ☐ METRIC ☐ IMPERIAL

ITEM	DESCRIPTION	W.O. NO.	DATE	PROJECT	REMARKS
1	Crosstube Installation, High Fuel	91335	?	?	Item ID D350-748-101
2	Crosstube Installation, High Fuel	87340	?	?	Item ID D350-748-101
3	Crosstube Ins. High Fuel	W.O. NO 85566	?	?	Item ID D350-748-101
4	Crosstube's Inst. High Fuel	W.O. NO 85567	?	?	Item ID D350-748-101

Item 1, 2, 3, 4 have pitting, indications, waiting for approval from engineer

13-04-02

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE Andy Sheldon PRINT ASheldon SIGNATURE
TECHNICIAN (SIGNATURE): Alexandre Michard DTR # E-120396
NAME (PRINT): Alexandre Michard 1ST TECHNICIAN
CGSB LEVEL 2 SNT LEVEL 2 CGSB REG. NO. 70148
2ND TECHNICIAN
CGSB LEVEL _____ SNT LEVEL _____ CGSB REG. NO. _____

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

Eric Downing

From: Patrick Smith
Sent: Monday, April 01, 2013 1:56 PM
To: Chris Provencal; Eric Downing
Cc: Linda Lacelle; Nigel Forbes
Subject: RE: pics of the cad platted

Thanks Chris,

Eric,
Make comments on the work order and proceed as required.

Pat

From: Chris Provencal
Sent: April-01-13 1:55 PM
To: Patrick Smith
Cc: Linda Lacelle; Eric Downing
Subject: RE: pics of the cad platted

It appears that the indications are from flaws in the CAD plating process, caused by the fact the tube was CAD platted twice. We don't see any CAD flaking off, so I can accept these tubes.

-Chris

From: Patrick Smith
Sent: Monday, April 01, 2013 12:50 PM
To: Chris Provencal
Cc: Linda Lacelle
Subject: FW: pics of the cad platted

Chris,

Here is the response from Cadorath,

Please notify us on your decision.

Pat

From: Linda Lacelle
Sent: April-01-13 12:18 PM
To: Patrick Smith
Cc: Eric Downing
Subject: Re: pics of the cad platted

Im not in today. I just need to know if these are good
So we can proceed with painting

Sent from my iPhone

On 2013-04-01, at 12:17 PM, "Patrick Smith" <psmith@dartaero.com> wrote:

I will come to see you.

Pat

From: Cisco Lindo [<mailto:cisco@cadorath.com>]
Sent: March-28-13 11:41 AM
To: Patrick Smith
Cc: 'chris jones'; 'Ed Balske'; 'Nick Wasylik'
Subject: RE: pics of the cad platted

Hi Patrick

We did not notice anything different with these after we did the chromate. Only the ends were stripped on these. We plated over the existing cad when they came back for the replating. Are the photos taken at MPI?

The cad deposit is higher than normal because of the plating over the existing deposit therefore it will show as a much courser finish than normal.

Are there any blisters on any of them? Is the cad flaking off?

Thanks

<image002.gif> **Francisco
Lindo**
Production

Cadorath Specialty -

Strength Through Diversity
Serving industries that better the world

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Cadorath News

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From: Patrick Smith [<mailto:psmith@dartaero.com>]
Sent: Thursday, March 28, 2013 9:17 AM
To: chris jones
Cc: cisco@cadorath.com; Linda Lacelle; Nigel Forbes; Eric Downing
Subject: FW: pics of the cad platted
Importance: High

Hi Chris,

I hope all is well.

We have some concerns with the finish of the last batch of tubes we received.

These are the tubes which were stripped, sent back to Dart, ground, sent to Cadorth for a second cadmium coating.

Pat

From: Eric Downing
Sent: March-28-13 6:59 AM
To: Patrick Smith
Subject: pics of the cad platted

These are all the pics I have about the cross tubes

Eric Downing
QC Corrdinator
T: 1-613-632-5200 ext 223
C: 1-613-363-9375
F: 1-613-632-5246
www.dartaero.com
Edowning@Dartaero.com
<image001.jpg>

Sms
B 9 10

5.0 PARTS LIST

Qty -101	Qty -201	Part Number	Description
X		D350-748-101	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD
	X	D350-748-201	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT
1		D350-748-141	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD
	1	D350-748-241	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT
*2	*2	D3502-1	SUPPORT
*2	*2	D2856-400-710	ABRASION STRIP
*1	*1	AELS-1032-225	INSERT
*2	*2	MS21920-20	CLAMP
*1	*1	MS27039-1-10	SCREW
*1	*1	AN960JD10	WASHER
4	4	D3500-1	SADDLE
16	16	D3501-1	BUSHING
16	16	AN4-6A	BOLT
8	8	AN4-41A	BOLT
4	4	AN5-32A	BOLT
32	32	AN960JD416	WASHER
8	8	AN960JD516	WASHER
24	24	MS21042L4	NUT (OR MS21042-4)
4	4	MS21042L5	NUT (OR MS21042-5)

* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/241 ASSEMBLIES ABOVE

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Revision: B
Date: 07.06.15